



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,748	04/12/2001	Michael Joseph Stirniman	STL 2932	2911

28063 7590 09/26/2003

SEAGATE TECHNOLOGY LLC
INTELLECTUAL PROPERTY DEPARTMENT
920 DISC DRIVE, MS/SV15B1
SCOTTS VALLEY, CA 95066-4544

EXAMINER

HOPKINS, ROBERT A

ART UNIT PAPER NUMBER

1724

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/833,748

Applicant(s)

STIRNIMAN ET AL.

Examiner

Robert A Hopkins

Art Unit

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 and 16-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6,8,10,12-14 and 20 is/are rejected.
- 7) ☒ Claim(s) 7,9,11 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claims 8,9 are objected to under 37 CFR 1.75(c) as being of improper dependant form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependant form, or rewrite the claims in independent form.

Claim 8 describes the function of the cold traps, but does not provide additional structural limitations to further limit claim 6.

Claim 9 depends on claim 8 and recites a method step(transferring the storage discs), and therefore also does not provide additional structural limitations to further limit claim 6.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6,8,10, and 12-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Noji et al(6158226).

Noji et al teaches a vapor lubrication station comprising one or more cold traps(18) to prevent migration of lubrication molecules that are not deposited

onto storage disks during a vapor lubrication process from the vapor lubrication station(10 in figure 2) into adjacent process chambers(20). Noji et al further teaches one or more entry/exit ports disposed between the vapor lubrication station and/or the adjacent process chambers, wherein the one or more cold traps are disposed around the one or more entry/exit ports, respectively. Noji et al further teaches wherein the vapor lubrication station is held under low working pressure in the range of about 5×10^{-5} to 5×10^{-9} Torr by means of high performance vacuum pumps(12). Noji et al further teaches wherein the cold traps comprise cold trapping surfaces(42) to prevent migration of lubrication molecules that are not deposited onto the disc into the adjacent process chambers. Noji et al further teaches wherein the cold trapping surfaces are cooled to have a temperature in the range of about -195 degrees C to 25 degrees C using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water(column 4 lines 58-62).

Claim 20 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Noji et al(6158226).

Noji et al teaches a vapor lubrication station comprising means(10) to deposit lubrication molecules onto storage disks, and means to prevent migration of lubrication molecules that are not deposited onto storage disks during a vapor lubrication process in the vapor lubrication station(10) into adjacent process chambers(20).

Claims 6,8,10, and 12-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lee et al(6241793).

Lee et al teaches a vapor lubrication station comprising one or more cold traps(40) to prevent migration of lubrication molecules that are not deposited onto storage disks during a vapor lubrication process from the vapor lubrication station(12 in figure 1) into adjacent process chambers(18). Lee et al further teaches one or more entry/exit ports disposed between the vapor lubrication station and/or the adjacent process chambers, wherein the one or more cold traps are disposed around the one or more entry/exit ports, respectively. Lee et al further teaches wherein the vapor lubrication station is held under low working pressure in the range of about 5×10^{-5} to 5×10^{-9} Torr by means of high performance vacuum pumps(not shown). Lee et al further teaches wherein the cold traps comprise cold trapping surfaces(60) to prevent migration of lubrication molecules that are not deposited onto the disc into the adjacent process chambers. Lee et al further teaches wherein the cold trapping surfaces are cooled to have a temperature in the range of about -195 degrees C to 25 degrees C using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water(column 5 lines 8-11).

Claim 20 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lee et al(6241793).

Noji et al teaches a vapor lubrication station comprising means(12) to deposit lubrication molecules onto storage disks, and means(40) to prevent migration of lubrication molecules that are not deposited onto storage disks during a vapor lubrication process in the vapor lubrication station(12) into adjacent process chambers(18).

Allowable Subject Matter

Claims 7,11,15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 recites "wherein the adjacent process chambers comprise : adjacent process chambers to deposit successive layers onto the storage discs to produce discs, and/or transport chambers used in transporting the storage discs between the process chambers". Noji and Lee fail to teach wherein the adjacent process chambers comprise : adjacent process chambers to deposit successive layers onto the storage discs to produce discs, and/or transport chambers used in transporting the storage discs between the process chambers. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide adjacent process chambers as recited in claim 7 because neither Noji nor Lee suggest such a modification.

Claim 11 recites "wherein the one or more entry/exit ports comprise gates and/or valves that open and close to receive and output the discs". Neither Noji nor Lee disclose wherein the one or more entry/exit ports comprise gates and/or valves that open and close to receive and output the discs. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide gates and/or valves because neither Noji nor Lee suggest such a modification.

Claim 15 recites "one or more temperature sensors to sense the temperature of the cold trapping surfaces and to output a signal proportional to

the sensed temperature; and a control circuitry coupled to the temperature sensors to monitor the temperature of the cold trapping surfaces by receiving the signal from the temperature sensors , and further to automatically shut-off the operation of the vapor lubrication station to prevent accidental migration of lubrication molecules due to a failure in the operation of the cold traps". Noji discloses a temperature sensor, but does not disclose a control circuitry coupled to the temperature sensors to monitor the temperature of the cold trapping surfaces by receiving the signal from the temperature sensors , and further to automatically shut-off the operation of the vapor lubrication station to prevent accidental migration of lubrication molecules due to a failure in the operation of the cold traps. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide the claimed control circuitry because Noji does not suggest such a modification.

Response to Arguments

Applicant's arguments filed August 12, 2003 have been fully considered but are deemed to be not persuasive.

Applicant argues Noji teaches using a cold trap for "evacuating a vacuum chamber" and not using a cold trap to prevent migration of lubrication molecules. Applicant further argues Noji does not suggest, mention, or allude to a vapor lubrication station as suggested by the Examiner in his comment "vapor lubrication station(10 in figure 2)". Applicant further argues that in fact, Noji's vapor lubrication station (10 in figure 2) is really a hermetic chamber and not a lubrication chamber.

Examiner initially refers applicant to the following passage on page 2 in the current specification which describes the vapor lubrication station: "Vapor lube station 210 deposits a thin uniform lubrication layer over a disc surface using a vapor deposition technique also referred to as a vapor lubrication process. The vapor lubrication process includes evaporating lubrication molecules continuously in the vapor lubrication station held under vacuum using a specially designed evaporator, and emitting evaporated lubrication molecules through special diffuser plates to control vapor emission onto the discs to provide a uniform thickness of lubricant onto the disc surface". Examiner also refers applicant to column 1 lines 10-15 of Noji et al wherein Noji et al describes vacuum chamber(101), wherein vacuum chamber(101) is clearly equivalent to vacuum chamber(10) in figure 2: "A vacuum chamber 101 is a processing chamber for processing semiconductor devices through processes such as etching or chemical vapor deposition(CVD). The processing chamber 101 is communicated with a vacuum pump 103 through a pipe 102". Examiner notes that since the vapor lubrication process is also referred to as a vapor deposition technique, and Noji et al clearly discloses a chemical vapor deposition technique is performed within the vacuum chamber(10) , therefore the "hermetic chamber 10" of Noji et al must also be a vapor lubrication station. Although lubrication is referred to with respect to old vacuum pumps, the terms lubrication and deposition are interchangeable as indicated in applicant's specification, therefore clearly a "vapor lubrication process" is clearly occurring within the vacuum chamber(10), and hence the vacuum chamber(10) can also be referred

to as a vapor lubrication station.

Applicant further argues Noji does not mention any pressure that is even within the approximate range of 5×10^{-5} to 5×10^{-9} Torr. Examiner notes that although the specific pressure range is not explicitly disclosed in Noji, such a pressure range is conventional for a chemical vapor deposition process, and since applicant has equated a vapor lubrication process with a vapor deposition technique, the pressure range is implicitly stated as being part of the chemical vapor deposition process in Noji.

Applicant further argues Noji does not mention, suggest or allude to the existence of any lubricant molecules that are deliberately deposited onto a disk. Examiner notes the claim is directed to the cold traps and the cold trapping surfaces, and that the "lubricant molecules" are not a structural element, the "lubricant molecules" are a fluid being worked upon by a structural element, and hence are not given patentable weight. Examiner notes Noji clearly discloses cold trapping surfaces, therefore the structural elements of the claim are anticipated.

Applicant further argues Noji does not teach cooling at temperatures anywhere near the temperature range of -195 degrees C to -25 degrees C. Examiner notes that liquid nitrogen and chilled water are recited in Noji, and since the refrigerants are exactly the same as those recited in the Markush expression, the claim is anticipated. Examiner further notes that the claim is directed to the refrigerants used and not to the temperature cooling range. Examiner further notes that the claim is an apparatus claim, and limitations to

cooling cold trapping surfaces to a certain temperature are process elements, and hence are not given patentable weight in an apparatus claim.

Applicant argues with respect to claim 20 that Noji does not disclose a lubrication station and or even suggest the existence of a lubrication station. Examiner refers applicant to the arguments with respect to claim 6, wherein examiner respectfully submits that Noji discloses a vapor lubrication station, and hence the claim is anticipated.

Applicant argues with respect to Lee et al that chamber 12 is clearly a furnace unit and not a lubrication station. Applicant further argues that , in fact, nowhere in the Lee patent is a lubricant or anything that resembles a lubricant mentioned. Examiner notes that within the furnace is a silicon nitride deposition system. As noted above , applicant in the current specification equates a vapor deposition technique with a vapor lubrication process. Therefore, because Lee clearly discloses a vapor deposition process within the "furnace", clearly the "furnace" must be a vapor lubrication station. Examiner respectfully submits that the silicon nitride film deposited on the wafers in the furnace is equivalent to the lubricant claimed in the vapor lubrication station. Applicant mentions depositing a thin uniform lubrication layer over a disc surface on page 2 of the current specification, therefore the silicon nitride film is equivalent to the lubrication layer and the wafer is equivalent to the disc.

Applicant further argues Lee does not mention any pressure that is even within the approximate range of 5×10^{-5} to 5×10^{-9} Torr. Examiner notes

that although the specific pressure range is not explicitly disclosed in Lee, such a pressure range is conventional for a chemical vapor deposition process, and since applicant has equated a vapor lubrication process with a vapor deposition technique, the pressure range is implicitly stated as being part of the chemical vapor deposition process in Lee.

Applicant further argues Lee does not mention, suggest or allude to the existence of any lubricant molecules that are deliberately deposited onto a disk. Examiner notes the claim is directed to the cold traps and the cold trapping surfaces, and that the "lubricant molecules" are not a structural element, the "lubricant molecules" are a fluid being worked upon by a structural element, and hence are not given patentable weight. Examiner notes Lee clearly discloses cold trapping surfaces, therefore the structural elements of the claim are anticipated.

Applicant further argues Lee does not teach cooling at temperatures anywhere near the temperature range of -195 degrees C to -25 degrees C. Applicant further argues Lee's temperature range is significantly different than that of applicant's claimed temperature range and therefore Lee et al does not anticipate the claim. Examiner notes that chilled water is recited in Lee, and since the refrigerant is exactly the same as that recited in the Markush expression(cold water), the claim is anticipated. Examiner further notes that the claim is directed to the refrigerants used and not to the temperature cooling range. Examiner further notes that the claim is an apparatus claim, and limitations to cooling cold trapping surfaces to a certain temperature are process

elements, and hence are not given patentable weight in an apparatus claim.

Applicant argues with respect to claim 20 that Lee does not disclose a lubrication station and or even suggest the existence of a lubrication station. Examiner refers applicant to the arguments with respect to claim 6, wherein examiner respectfully submits that Lee discloses a vapor lubrication station, and hence the claim is anticipated.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

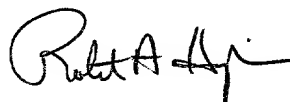
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A Hopkins whose telephone number is 703-308-3913. The examiner can normally be reached on Monday-Friday 9:00am-3:00pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on 703-308-1261.

Application Number : 09/833,748
Art Unit : 1724

The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9572 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read "Robert A. Hopkins".

Robert A Hopkins
Primary Examiner
Art Unit 1724

rah
September 23, 2003